

TEST: Avian Reproduction

SPECIES: Mallard Duck (Anas platyrhynchos)

RESULTS: Muscalure was fed to mature Mallard ducks at dietary concentrations of 2.0 ppm and 20.0 ppm throughout a One-Generation Reproduction Study and had no effect on the overall reproductive success (14-day-old survivors/hen) of the birds at the 2.0 ppm dosage level. At 20 ppm, statistically significant adverse effects were noted in normal hatchlings of live three-week embryos (as a percent of the control) and the number of 14-day-old survivors per hen.

ADDITIONAL DATA: Table One

	<u>Controls</u>	<u>Muscalure (ppm)</u>	
		<u>2.0</u>	<u>20.0</u>
Eggs Laid	943	1026	1042
Eggs Cracked	8	17	13
Eggs Set*	895	969	990
Viable Embryos	849	896	901
Live Three-Week Embryos	838	891	885
Normal Hatchlings	508	499	372
14-Day-Old Survivors	500	480	363

*Excludes those cracked and those removed for eggshell thickness analysis.

Table Two (See following page)

CHEMICAL: Z-9-Tricosene (98.7% ai)

TITLE: One-Generation Reproduction Study--Mallard Duck Muscalure

AUTHOR: Wildlife International, Division Truslow Farms

STUDY DATE: April 29 1975



ACCESSION NO.: 232388

REGISTRANT: Farnam Company, Inc.

VALIDATION CATEGORY: CORE

ADDITIONAL DATA (CONT.) Table Two

<u>Expected Values</u>		<u>Controls</u>	<u>Muscalure (ppm)</u>	
			<u>2.0</u>	<u>20.0</u>
Eggs Laid Per Hen in Eight Weeks	28-38	39.3	42.8	43.4
Eggs Cracked Of Eggs Laid (%)	0.6-6	0.8	1.6	1.2
Viable Embryos Of Eggs Set (%)	85-98	95	92	91
Live Three- Week Embryos Of Viable Eggs (%)	97-99	99	99	98
Normal Hatch- lings of Live Three-Week Embryos (%)	50-90	61	56	42*
14-Day-Old Survivors Of Normal Hatch- lings (%)	94-99	98	96	98
14-Day-Old Survivors Per Hen	11-14	20.8	20.0	15.1*

Statistical analysis based on data in Table One.

*The above differences were statistically significant (p 0.05).

ADDITIONAL DATA (CONT.): Table Three

	<u>Controls</u>	<u>Muscalure (ppm)</u>	
		<u>2.0</u>	<u>20.0</u>
Number of Eggs Analyzed	40	40	40
Mean Shell Thickness	0.36	0.352	0.345

The above differences were not statistically significant (p 0.05).

Additional Notes: Protocol differed from that suggested in the guidelines as follows: Body weights were measured at test initiation and termination and not at week #2,4,6,8 as suggested by recommended protocol. Photoperiod for the first seven weeks was 5 hours per day rather than 7 hours per day and illumination was 5 footcandles rather than 6. Birds were maintained at ambient temperature for the first 13 weeks of the study (End October thru mid-January). During the last 14 weeks of the study, birds were maintained at 10°C (50°F) rather than 21°C and eggs were incubated at 37.5°C rather than 39°C.

None of these differences were considered serious enough to invalidate the study. Despite these differences in photoperiod and temperatures, egg production, viability, hatchability and survival in the control group were all within a range of expected values for these parameters.

AVIAN REPRODUCTION STUDY: MALLARD

Summary of Raw Data--Statistical Analysis

<u>Eggs Laid</u>	<u>\bar{x}</u>	<u>F Test</u>
Control	188.6	1.25 3.89
2.0 ppm	205.2	Not Significant
20.0 ppm	208.4	(p 0.05)
<u>Eggs Cracked</u>	<u>\bar{x}</u>	<u>F Test</u>
Control	1.6	0.57 3.89
2.0 ppm	3.4	Not Significant
20.0 ppm	2.6	(p 0.05)
<u>Eggs Set</u>	<u>\bar{x}</u>	<u>F Test</u>
Control	179.0	0.96 3.89
2.0 ppm	193.8	Not Significant
20.0 ppm	198.0	(p 0.05)
<u>Viable Embryos</u>	<u>\bar{x}</u>	<u>F Test</u>
Control	169.8	0.35 3.89
2.0 ppm	179.2	Not Significant
20.0 ppm	180.2	(p 0.05)
<u>Live Three-Week Embryos</u>	<u>\bar{x}</u>	<u>F Test</u>
Control	167.6	0.32 3.89
2.0 ppm	178.2	Not Significant
20.0	177.0	(p 0.05)

<u>Normal Hatchlings</u>	<u>\bar{x}</u>	<u>F Test</u>
Control	101.6	2.16 3.89 (p 0.05)
2.0 ppm	99.8	2.16 2.81 (p 0.05)
20.0 ppm	74.4	Not Significant
<u>14-Day Survivors</u>	<u>\bar{x}</u>	<u>F Test</u>
Control	62.5	2.31 3.47 (p 0.05)
2.0 ppm	60.0	2.31 2.57 (p 0.05)
20.0 ppm	45.4	Not Significant
<u>Egg Shell Thickness</u>	<u>\bar{x}</u>	<u>F Test</u>
Control	0.3608	0.027 3.89
2.0 ppm	0.3618	Not Significant
20.0 ppm	0.3626	(p 0.05)

FARNAM, INC. FINK
MALLARD + Duck (1975)

Eggs LAID

175.
179.
214.
170.
205.

188.6
307.44

196.
223.
224.
194.
189.

-205.2
228.56

235.
219.
165.
209.
214.

208.4
547.04

1.251735855 $\angle 3.89$
2. \therefore
12. n.s. @

5415.2 \therefore
1129.73333 \therefore
6544.93333 \therefore

Eggs SET

185.
169.
204.
158.
179.

179.
240.4

176.
205.
220.
179.
189.

193.8
274.16

211.
210.
145.
204.
220.

198.
728.4

.9617043188 $\angle 3.89$
2. \therefore
12. n.s.
@ .05

6214.8
996.1333334
7210.933333

Viable
Embryos

167.
153.
195.
152.
182.

169.8
278.16

180.
197.
180.
172.
167.

179.2
103.76

208.
194.
129.
180.
190.

180.2
736.16

.3533199771 $\angle 3.89$
2. \therefore
12. n.s. @

5590.4 \therefore
329.2
5919.6

Reviewed by Betty 8/31/78

Live three
week embryos

186.
153.
191.
149.
179.

167.6
247.84

181.
199.
155.
171.
185.

178.2
215.36

212.
185.
126.
177.
185.

177.
790.8

.3224242425 \angle 3.89

2. .
12. n.s. @
.05

6270.
336.9333334
6606.933333

Normal
Hatchlings

106.
94.
83.
109.
116.

101.6
137.04

96.
97.
100.
87.
119.

99.8
110.96

57.
77.
32.
76.
130.

74.4
1040.24

2.155250574 \angle 3.89

2. .
12. n.s. @
.05

6441.2
2313.733333
8754.933333

14 DAY OLD SURVIVORS

14 DAY-OLD
Survivors

44.
65.
57.
75.
80.
63.
43.
73.

62.5
166.5

23.
72.
69.
82.
65.
43.
45.
81.

60.
382.25

15.
60.
33.
67.
53.
45.
43.
47.

45.375
227.984375

2.313431635

2.
21. .

6213.875
1369.083333
7582.958333

\angle 3.47 (.05)
 \angle 2.57 (.1)
42.81 (1)
42.81 (1)
n.s.

Eggs cracked

2.
3.
2.
1.
0.

1.6
1.04

4.
10.
1.
2.
0.

3.4
12.64

0.
5.
1.
4.
3.

2.6
3.44

.5700934579 < 3.89

2.
12. n.s.

85.6
8.133333333
93.73333333

@ .05

Egg shell
Thickness

0.356
0.374
0.362
0.35
0.362

0.3608
0.00006336

0.374
0.386
0.34
0.349
0.36
0.362

.3618333333
.0002294722

0.368
0.37
0.359
0.367
0.349

0.3626
0.00006024

.0266104048 < 3.89

2.
13. n.s.

.0019948333
.0000081667
0.002003